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# PATENT SPECIFICATION

DRAWINGS ATTACHED

1,007,437

*Inventor:* REGINALD GEORGE WHITEHOUSE

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**Int. Cl.:**—F 06 k

## COMPLETE SPECIFICATION

### Improvements relating to Valves for Controlling the Flow of Gases and/or Vapours

We, ASSOCIATED ELECTRICAL INDUSTRIES LIMITED, a British Company having its registered office at 33 Grosvenor Place, London, S.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to valves for controlling the flow of gases and/or vapours, more particularly for use in steam turbine plant, herein referred to as steam valves. The invention is concerned with such valves of the kind in which the steam flows through two seatings spaced axially one above the other which are closed by a bung or stopper mounted on the valve spindle. Steam passing through the top seating is turned down through axial passages in the bung to the valve outlet where it is joined by that flowing through the bottom seating.

The passages between the valve seatings and the exterior of the bung have a venturi formation which greatly assists in pressure recovery which is of great importance in valves for controlling steam at the high pressures and temperatures which exist in present day steam turbines. Such valves are commonly referred to as "double-beat valves".

An object of this invention is to provide a control valve in which the pressure loss from inlet to discharge is reduced to a minimum, and violent vibration of valve and spindle is avoided.

In a double-beat steam valve constructed according to this invention the steam flow passage above the top seating is defined between a fixed top cover of the valve body and the top part of the bung and is so shaped as to provide in all positions of the bung up to the fully open position a smooth inward "U" turn merging into the axial flow passages through the bung.

Preferably the wall of the valve casing

which defines the top of the steam flow passage is directed into the passage through the bung so as to provide a chip shield which guards against fragments in the steam passing between the valve spindle guide at the top of the valve.

An embodiment of the invention as illustrated schematically by the sectional drawing accompanying the Provisional Specification comprises an outer casing 1 with a side steam inlet 2, a bottom outlet 3 and a top cover 4. The casing contains a valve body 5 which incorporates a steam strainer 6 of usual perforated construction and upper and lower axially spaced valve seatings 7, 8.

A valve spindle 9 slidably mounted in guides 10 carries the valve stopper or bung 11 which is formed exteriorly with sealing faces which co-operate with the seatings 7, 8. The bung has a hub 12 secured in position on the spindle by a nut 13, and is formed with axial flow passages 14. At its lower end hub 12 is extended over the top of guide 10 to provide a shield 15 which prevents fragments in the steam flow from passing to the spindle and causing seizure between spindle and guide. In the illustrated example lower guide 10 is supported by webs within the outlet end of body 5. The steam flow passage 16 below valve seating 8 and between bung 11 and body 5 diverges downwardly to provide a venturi action in known manner.

The passage 17 defined by the inside surface of body 5 above or beyond valve seating 7, the under surface of cover 4 and the top edge of bung 11 has a U-shaped configuration when viewed in section, thus providing a smooth turn round for top flow into passages 14 irrespective of the valve position at any point of lift. Passages 14 diverge downwardly and together constitute a passage through the bung of progressively increasing cross section forming in conjunction with the outlet side of passage 17 a venturi passage for steam flow

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from top seating 7. This second venturi in combination with the usual venturi 16 greatly assists pressure recovery for the steam flow through both seatings resulting in lower pressure losses than in valves as hitherto constructed.

The smooth turn round of the passage 17 facilitates in addition the provision of a chip shield for spindle 9 in the region of top guide 10. As shown in the drawing at 18, the under surface of cover 4 is directed into the top of the bung around nut 13 thus completely guarding against fragments being brought into contact with the valve spindle and causing seizure.

WHAT WE CLAIM IS:—

1. A double-beat steam valve for gases or vapours as herein specified, wherein the flow passage for the steam above the top seating is defined between a fixed top cover of the valve body and the top part of the bung and is so shaped as to provide in all positions of the bung up to the fully open position a smooth inward "U"-turn merging into the axial flow passages through the bung.

2. A double-beat valve as claimed in claim 1, wherein the axial flow passages in the bung are downwardly divergent and together constitute a venturi passage for the steam from

the top seating to the outlet in addition to the usual venturi passage from the bottom seating of the valve between the bung and the valve body.

3. A double-beat valve as claimed in claim 1 or 2, in which a fixed upper part of the valve body is formed with a surface portion which is directed into the passage through the bung, hereby providing a chip shield surrounding the valve spindle in the region above the bung.

4. A double-beat valve as claimed in claim 3, in which the said surface portion is formed on the fixed cover which closes the top of the valve body.

5. A double-beat valve as claimed in claims 1 to 4, wherein the bung has a central hub which is downwardly extended over a fixed central guide for the spindle to form a chip shield surrounding the lower part of the valve spindle.

6. A double-beat valve constructed and arranged substantially as described herein and shown in the drawing filed with the Provisional Specification.

J. W. RIDDING,  
Chartered Patent Agent,  
33, Grosvenor Place, London, S.W.1,  
Agent for the Applicants.

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PROVISIONAL SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

